REVIEWED FOR CODE COMPLIANCE

10/20/2023

October 10th, 2023

Mr. Jonny Macfarlane
Mays Construction Specialties
2399 Riverside Parkway
Grand Junction, Colorado 81505
970-245-0834 ph

RE: RE: Basecamp Townhomes – Production Micropile Proof Tests result and acceptance

Dear Mr. Macfarlane

Attached, please find the results of micropile proof tests performed on 10-02-23 on production micropiles #35, #50, & #58. The pile installation for the micropile proof tests conducted on 10-02-23 was accomplished using simultaneous drilling and grouting operations through a hollow reinforcing bar using a 5" effective drill hole diameter. The upper 8'-0" of each micropile is PVC sleeve to allow the bar to elongate through the upper soils and provide continuous corrosion protection into the grade beam concrete.

Proof Test Pile #35 – Tension Test – The pile was installed to a 20'-6" total bonded and 28'-6" overall below grade length using the drilling method described above. At 160% of the 58 kip design load, the micropile experienced permanent and elastic movement of 0.212" and 0.211"; respectively. At the end of the test, the micropile de-bonded -5.06'' and has an apparent bond length of 25.56'. This indicates that the full length of the PVC sleeve has not debonded; however, does not affect the long term performance of the micropile deep foundation element. The creep during the 10 minute creep hold period produced 0.003" of movement, which is less than the 0.040" allowed by NHI-05-039 "Micropile Design and Construction Manual" in the first 10 minutes; therefore, the creep test was concluded.

Proof Test Pile #50 – Tension Test – The pile was installed to a 25'-6" total bonded and 33'-6" overall below grade length using the drilling method described above. At 160% of the 65 kip design load, the micropile experienced permanent and elastic movement of 0.069" and 0.350"; respectively. At the end of the test, the micropile de-bonded -0.75'' and has an apparent bond length of 26.25'. This indicates that the full length of the PVC sleeve has not debonded; however, does not affect the long term performance of the micropile deep foundation element. The creep during the 10 minute creep hold period produced 0.001" of movement, which is less than the 0.040" allowed by NHI-05-039 "Micropile Design and Construction Manual" in the first 10 minutes; therefore, the creep test was concluded.

PRINTZ ENGINEERING SERVICES, LLC
1248 W. EL TORO WAY
PUEBLO WEST, CO 81007
TPRINTZ@PRINTZENGINEERINGSERVICES.COM

Proof Test Pile #58 – Tension Test – The pile was installed to a 10'-6" total bonded and 18'-6" overall below grade length using the drilling method described above. At 160% of the 37 kip design load, the micropile experienced permanent and elastic movement of 0.105" and 0.380"; respectively. At the end of the test, the micropile de-bonded -0.29'' and has an apparent bond length of 10.79'. This indicates that the full length of the PVC sleeve has not debonded; however, does not affect the long term performance of the micropile deep foundation element. The creep during the 10 minute creep hold period produced 0.003" of movement, which is less than the 0.040" allowed by NHI-05-039 "Micropile Design and Construction Manual" in the first 10 minutes; therefore, the creep test was concluded

All the micropiles tested meet all the acceptance criteria and are accepted by Printz Engineering Services, LLC as meeting the design intent.

Please do not hesitate to contact me with any questions or concerns that you may have.

Kind Regards,

Thomas A. Printz, P.E.
President
Printz Engineering Services, LLC
(303)-916-1617

10-10-2023

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10/20/2023

Attachments:
Proof Test Pile #35 reduced data (5 pages)
Proof Test Pile #50 reduced data (5 pages)
Proof Test Pile #58 reduced data (5 pages)
Calibration (1 page)

Steamboat Basecamp Townhomes - 58 Kip Micropile Proof Test						Tested By Trever (MCSI) Observed by Enrique (NWCC)												
Micropile:			#35				**Test Date:**				10/02/23		**No. of Piles:**			1		
Starting Free Length:			11.00	ft	33	in	**Design Load:**			58	kip		**Modulus of Elasticity:**			29000	kip/in2	
Starting Bond Length:			20.50	ft	246	in							**Bar Diameter:**		T40/20	1.570	in	
Below Ground Free Length:			8	ft	96	in	**Max Test Load (160% DL):**			93	kip		**Bar Area:**			1.05	in2	
Above Ground Free Length:			3.00	ft	36	in							**G.U.T.S per Bar:**				kip	
Total Length:			31.50	ft	378	in												
Theoretical Elongation (calculate at max test load):					0.101	inches							**Jack-Gauge Factor:**			0.01247164	kip/psi	
													Load Cell Serial Number:			-		
							Ram ID						**Load Cell Zero reading (avg.):**			-		
							Pump ID						**Load Cell Scale Factor:**			-		
							Gauge ID						**Load Cell Offset:**			-		
							Ref. Gauge											

% Design Load (%)	Holding Time (min)	Spec. Load (kips)	Calc. Jack Press. (psi)	Time of Reading (24h)	Observed Jack Press. (psi)	Dial Gauge G1 (in)	Dial Gauge G2 (in)	Correct. Avg. (in)	Elastic Movement (theoretical)	Comments	
5%	2.5	2.9	238	3:40	240	0.0000	0.0000	0.0000	0.003	alignment load	
15%	2.5	8.7	702	3:47	705	0.0200	0.0650	0.0425	0.009		
30%	2.5	17.4	1398	3:50	1400	0.1580	0.1390	0.1485	0.019		
45%	2.5	26.1	2094	3:53	2100	0.2030	0.2040	0.2035	0.028		
60%	2.5	34.8	2790	3:56	2791	0.2400	0.2570	0.2485	0.038		
75%	2.5	43.5	3486	3:59	3492	0.2730	0.2980	0.2855	0.047		
90%	2.5	52.2	4182	4:01	4193	0.2890	0.3230	0.3060	0.057		
100%	2.5	58.0	4646	4:05	4651	0.3340	0.3820	0.3580	0.063		
115%	2.5	66.7	5342	4:07	5351	0.3560	0.4010	0.3785	0.073		
130%	0	75.4	6038	4:08	6040	0.3680	0.4150	0.3915	0.082		
130%	1	75.4	6038	4:09	6041	0.3690	0.4160	0.3925	0.082		
130%	2	75.4	6038	4:10	6042	0.3690	0.4170	0.3930	0.082		
130%	3	75.4	6038	4:11	6043	0.3700	0.4160	0.3930	0.082		
130%	4	75.4	6038	4:12	6042	0.3690	0.4170	0.3930	0.082		
130%	5	75.4	6038	4:13	6042	0.3700	0.4170	0.3935	0.082		
130%	6	75.4	6038	4:15	6040	0.3710	0.4170	0.3940	0.082		
130%	10	75.4	6038	4:19	6042	0.3710	0.4180	0.3945	0.082	0.003	Creep
145%	2.5	84.1	6734	4:22	6743	0.3780	0.4270	0.4025	0.091		
160%	2.5	92.8	7430	4:25	7432	0.3990	0.4470	0.4230	0.101		
130%	4	75.4	6038	4:30	6043	0.3960	0.4390	0.4175	0.082		
100%	4	58.0	4646	4:34	4648	0.3810	0.4230	0.4020	0.063		
75%	4	43.5	3486	4:38	3490	0.3720	0.4170	0.3945	0.047		
50%	4	29.0	2326	4:42	2330	0.3660	0.4030	0.3845	0.032		
25%	4	14.5	1166	4:47	1170	0.2650	0.3180	0.2915	0.016		
5%	4	2.9	238	4:51	242	0.1850	0.2390	0.2120	0.003	0.211	Elastic Movement

Steamboat Basecamp Townhomes - 58 Kip Micropile Proof Test

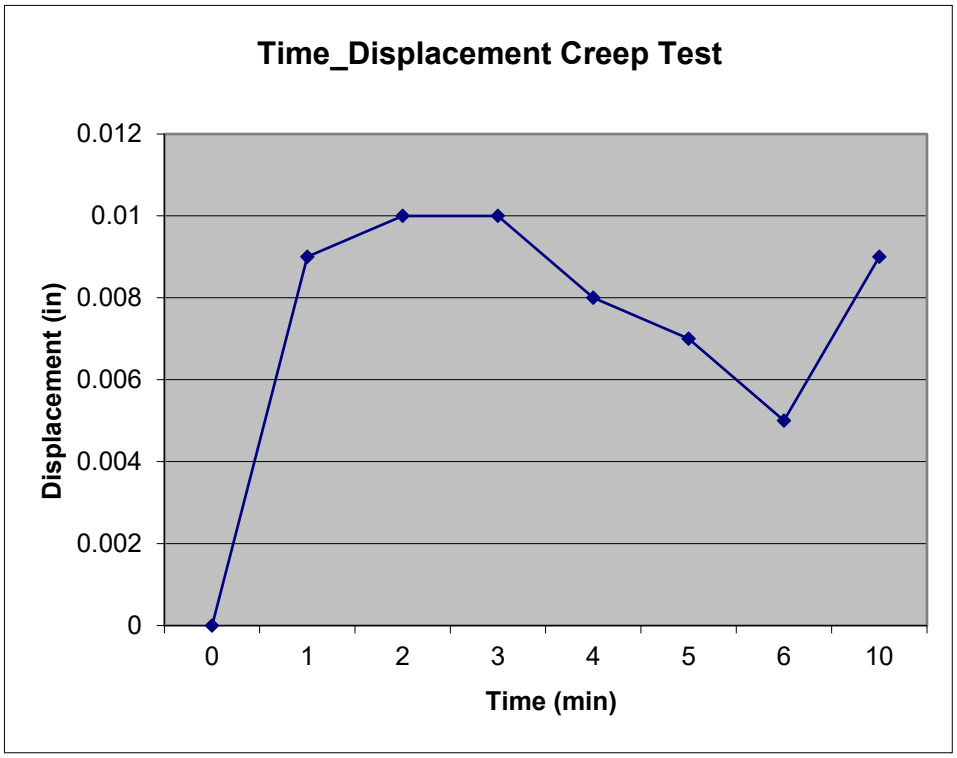
Anchor:	#35			
Starting Free Length:	11.00	ft	33	in
Starting Bond Length:	20.50	ft	246	in
Below Ground Free Length:	8.00	ft	96	in
Above Ground Free Length:	3.00	ft	36	in
Total Length:	31.50	ft	378	in
Theoretical Elongation (calculate at max test load):			0.101	inches
Apparent Free Length:	**71.2**	inches	**5.94**	ft
Debonding:	**-60.8**	inches	**-5.06**	ft
Apparent Bond Length:	**306.8**	inches	**25.56**	ft

Test Date:	10/02/23	
Design Load:	58	kip
Est. Lock-off Load:	0	kip
Max Test Load (160%):	93	kip

No. of Strands:	1	
Modulus of Elasticity:	29000	kip/in2
Strand Area:	1.046	in2
G.U.T.S per strand:	0	kip
G.U.T.S. per anchor:	0	kip
Jack-Gauge Factor:	0.012471643	kip/psi
Load Cell Serial Number:	-	
Load Cell Zero reading (avg.):	-	
Load Cell Scale Factor:	-	
Load Cell Offset:	-	

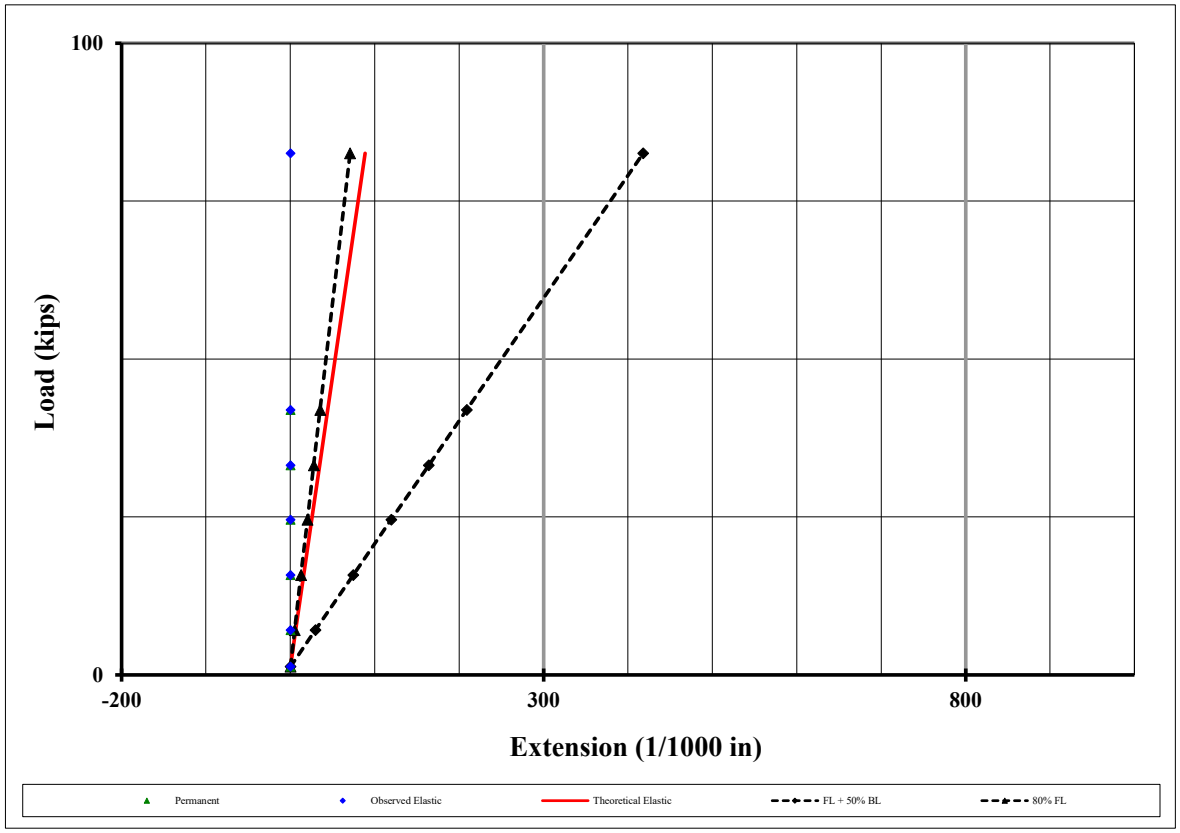
% Design Load (%)	Holding Time (min)	Spec. Load (kips)	Time of Reading (24h)	Calc. Jack Press. (psi)	Observed Jack Press. (psi)	Observed Jack Press. (kips)	Dial Gauge G1 (in)	Dial Gauge G2 (in)	Dial Gauge Corrected (in)	Total Movement (in)	Perm. Movement (in)	Elastic Movement (in)	Elastic Movement (theory)
5%	2.5	2.9	3:40	238	240	1.3	0.0000	0.0000	0.0000	0.0000			0.0032
15%	2.5	8.7	3:47	702	705	7.1	0.0200	0.0650	0.0425	0.0425			0.0095
30%	2.5	17.4	3:50	1398	1400	15.8	0.1580	0.1390	0.1485	0.1485			0.0189
45%	2.5	26.1	3:53	2094	2100	24.6	0.2030	0.2040	0.2035	0.2035			0.0284
60%	2.5	34.8	3:56	2790	2791	33.2	0.2400	0.2570	0.2485	0.2485			0.0379
75%	2.5	43.5	3:59	3486	3492	41.9	0.2730	0.2980	0.2855	0.2855			0.0473
90%	2.5	52.2	4:01	4182	4193	50.7	0.2890	0.3230	0.3060	0.3060			0.0568
100%	2.5	58.0	4:05	4646	4651	56.4	0.3340	0.3820	0.3580	0.3580			0.0631
115%	2.5	66.7	4:07	5342	5351	65.2	0.3560	0.4010	0.3785	0.3785			0.0726
130%	0	75.4	4:08	6038	6040	73.8	0.3680	0.4150	0.3915	0.3915			
130%	1	75.4	4:09	6038	6041	73.8	0.3690	0.4160	0.3925	0.3925			0.0820
130%	2	75.4	4:10	6038	6042	73.8	0.3690	0.4170	0.3930	0.3930			0.0820
130%	3	75.4	4:11	6038	6043	73.8	0.3700	0.4160	0.3930	0.3930			0.0820
130%	4	75.4	4:12	6038	6042	73.8	0.3690	0.4170	0.3930	0.3930			0.0820
130%	5	75.4	4:13	6038	6042	73.8	0.3700	0.4170	0.3935	0.3935			0.0820
130%	6	75.4	4:15	6038	6040	73.8	0.3710	0.4170	0.3940	0.3940			
130%	10	75.4	4:19	6038	6042	73.8	0.3710	0.4180	0.3945	0.3945			
145%	2.5	84.1	4:22	6734	6743	82.6	0.3780	0.4270	0.4025	0.4025			0.0915
160%	2.5	92.8	4:25	7430	7432	91.2	0.3990	0.4470	0.4230	0.4230	0.2120	0.2110	0.1010
130%	4	75.4	4:30	6038	6043	73.8	0.3960	0.4390	0.4175	0.4175			0.0820
100%	4	58.0	4:34	4646	4648	56.4	0.3810	0.4230	0.4020	0.4020			0.0631
75%	4	43.5	4:38	3486	3490	41.9	0.3720	0.4170	0.3945	0.3945			0.0473
50%	4	29.0	4:42	2326	2330	27.4	0.3660	0.4030	0.3845	0.3845			0.0315
25%	4	14.5	4:47	1166	1170	12.9	0.2650	0.3180	0.2915	0.2915			0.0158
5%	4	2.9	4:51	238	242	1.3	0.1850	0.2390	0.2120	0.2120			0.0032

Test Load	Time	Dial Gauge	Creep
(kips)	(min)	(in)	(in)
82.88235	0	0.417	0
82.89484	1	0.426	0.009
82.86986	2	0.427	0.01
82.93232	3	0.427	0.01
82.93232	4	0.425	0.008
82.94481	5	0.424	0.007
82.96979	6	0.422	0.005
82.94481	10	0.426	0.009



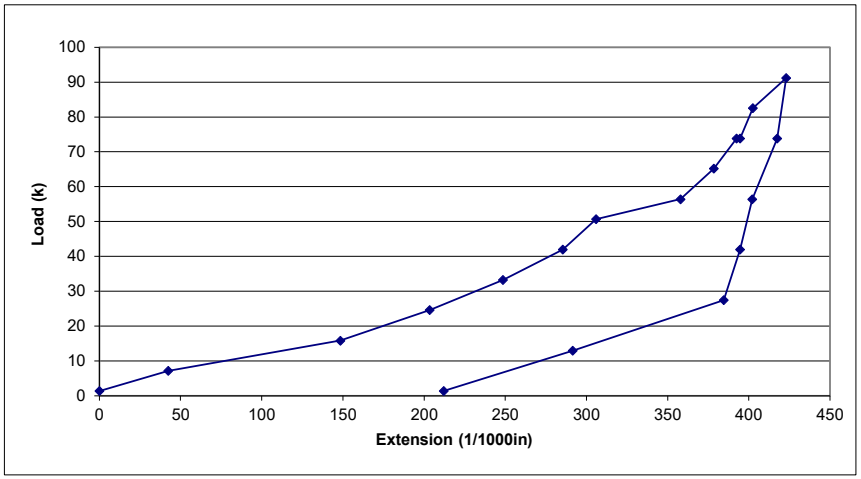
Anchor: Steamboat Basecamp Townhomes - 58 Kip Micropile Proof Test

Target % Des. Load (%)	Target % Des. Load (KIPS)	Calculated Load (kips)	Total Movement (0.001 in)	Perm. Movement (0.001 in)	Elastic Movement (0.001 in)	Theoretical Elast. Move. (0.001 in)	Free + 50% Bond Length (0.001 in)	80% Free Length (0.001 in)
5%	3	1	0.0	0.0	0.0	0	0	0
25%	9	7	42.5	0.0	0.0	6	30	5
50%	17	16	148.5	0.0	0.0	16	75	13
75%	26	25	203.5	0.0	0.0	25	119	20
100%	35	33	248.5	0.0	0.0	35	164	28
120%	44	42	285.5	0.0	0.0	44	209	35
167%	84	83	402.5	0.0	0.0	88	418	71



Anchor: Steamboat Basecamp Townhomes - 58 Kip Micropile Proof Test

Target % Des. Load (%)	Spec. Load (kisp)	Observed Load Jack (psi)	Observed Load Jack (kips)	Total Movement (in)	Total Movement (1/1000in)
5.0%	3	240.00	1.32	0.000	0
15.0%	9	705.00	7.13	0.043	43
30.0%	17	1400.00	15.81	0.149	149
45.0%	26	2100.00	24.56	0.204	204
60.0%	35	2791.00	33.19	0.249	249
75.0%	44	3492.00	41.95	0.286	286
90.0%	52	4193.00	50.70	0.306	306
100.0%	58	4651.00	56.42	0.358	358
115.0%	67	5351.00	65.17	0.379	379
130.0%	75	6041.00	73.79	0.393	393
130%	75	6042.00	73.80	0.395	395
145%	84	6743.00	82.56	0.403	403
160%	93	7432.00	91.16	0.423	423
130%	75	6043.00	73.81	0.418	418
100%	58	4648.00	56.39	0.402	402
75%	44	3490.00	41.92	0.395	395
50%	29	2330.00	27.43	0.385	385
25%	15	1170.00	12.94	0.292	292
5%	3	242.00	1.35	0.212	212



Steamboat Basecamp Townhomes - 65 Kip Micropile Proof Test						Tested By Trever (MCSI) Observed by Enrique (NWCC)											
Micropile:			#50				**Test Date:**			10/002/2023		**No. of Piles:**			1		
Starting Free Length:			11.00	ft	33	in	**Design Load:**			65	kip	**Modulus of Elasticity:**			29000	kip/in2	
Starting Bond Length:			25.50	ft	306	in						**Bar Diameter:**		T40/16	1.570	in	
Below Ground Free Length:			8	ft	96	in	**Max Test Load (160% DL):**			104	kip	**Bar Area:**			1.22	in2	
Above Ground Free Length:			3.00	ft	36	in						**G.U.T.S per Bar:**				kip	
Total Length:			36.50	ft	438	in											
Theoretical Elongation (calculate at max test load):					0.097	inches						**Jack-Gauge Factor:**			0.01247469	kip/psi	
												Load Cell Serial Number:			-		
							Ram ID					**Load Cell Zero reading (avg.):**			-		
							Pump ID					**Load Cell Scale Factor:**			-		
							Gauge ID					**Load Cell Offset:**			-		
							Ref. Gauge										

% Design Load (%)	Holding Time (min)	Spec. Load (kips)	Calc. Jack Press. (psi)	Time of Reading (24h)	Observed Jack Press. (psi)	Dial Gauge G1 (in)	Dial Gauge G2 (in)	Correct. Avg. (in)	Elastic Movement (theoretical)	Comments
5%	2.5	3.3	266	11:55	272	0.0000	0.0000	0.0000	0.003	alignment load
15%	2.5	9.8	786	11:59	790	0.0370	0.0360	0.0365	0.009	
30%	2.5	19.5	1566	12:02	1572	0.0990	0.0800	0.0895	0.018	
45%	2.5	29.3	2346	12:05	2352	0.1560	0.1320	0.1440	0.027	
60%	2.5	39.0	3126	12:08	3130	0.2140	0.1810	0.1975	0.036	
75%	2.5	48.8	3906	12:11	3911	0.2750	0.2270	0.2510	0.045	
90%	2.5	58.5	4686	12:14	4687	0.3330	0.2700	0.3015	0.054	
100%	2.5	65.0	5206	12:17	5212	0.3800	0.2960	0.3380	0.061	
115%	2.5	74.8	5986	12:20	5990	0.4180	0.3220	0.3700	0.070	
130%	0	84.5	6766	12:21	6769	0.4170	0.3300	0.3735	0.079	
130%	1	84.5	6766	12:22	6770	0.4260	0.3300	0.3780	0.079	
130%	2	84.5	6766	12:23	6768	0.4270	0.3290	0.3780	0.079	
130%	3	84.5	6766	12:24	6773	0.4270	0.3270	0.3770	0.079	
130%	4	84.5	6766	12:25	6773	0.4250	0.3230	0.3740	0.079	
130%	5	84.5	6766	12:26	6774	0.4240	0.3220	0.3730	0.079	
130%	6	84.5	6766	12:27	6776	0.4220	0.3220	0.3720	0.079	
130%	10	84.5	6766	12:31	6774	0.4260	0.3230	0.3745	0.079	0.001 Creep
145%	2.5	94.3	7546	12:33	7551	0.4430	0.3420	0.3925	0.088	
160%	2.5	104.0	8326	12:35	8330	0.4700	0.3670	0.4185	0.097	
130%	4	84.5	6766	12:39	6769	0.4580	0.3540	0.4060	0.079	
100%	4	65.0	5206	12:43	5212	0.4430	0.3370	0.3900	0.061	
75%	4	48.8	3906	12:47	3910	0.3640	0.2600	0.3120	0.045	
50%	4	32.5	2606	12:52	2612	0.2950	0.1950	0.2450	0.030	
25%	4	16.3	1306	12:56	1310	0.2000	0.1050	0.1525	0.015	
5%	4	3.3	266	1:01	272	0.1120	0.0260	0.0690	0.003	0.350 Elastic Movement

Steamboat Basecamp Townhomes - 65 Kip Micropile Proof Test

Anchor:	#50			
Starting Free Length:	11.00	ft	33	in
Starting Bond Length:	25.50	ft	306	in
Below Ground Free Length:	8.00	ft	96	in
Above Ground Free Length:	3.00	ft	36	in
Total Length:	36.50	ft	438	in
Theoretical Elongation (calculate at max test load):			0.097	inches
Apparent Free Length:	**123.0**	inches	**10.25**	ft
Debonding:	**-9.0**	inches	**-0.75**	ft
Apparent Bond Length:	**315.0**	inches	**26.25**	ft

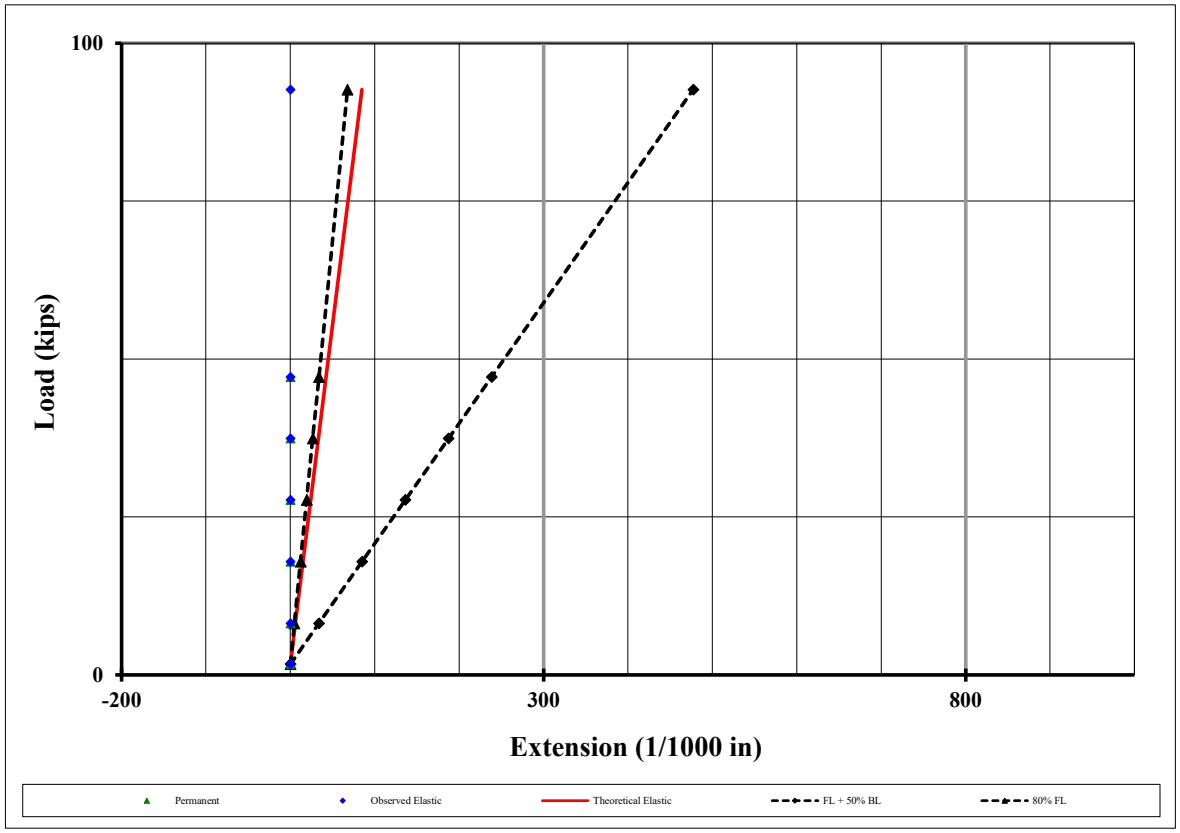
Test Date:	10/002/2023	
Design Load:	65	kip
Est. Lock-off Load:	0	kip
Max Test Load (160%):	104	kip

No. of Strands:	1	
Modulus of Elasticity:	29000	kip/in2
Strand Area:	1.222	in2
G.U.T.S per strand:	0	kip
G.U.T.S. per anchor:	0	kip
Jack-Gauge Factor:	0.012474691	kip/psi
Load Cell Serial Number:	-	
Load Cell Zero reading (avg.):	-	
Load Cell Scale Factor:	-	
Load Cell Offset:	-	

% Design Load (%)	Holding Time (min)	Spec. Load (kips)	Time of Reading (24h)	Calc. Jack Press. (psi)	Observed Jack Press. (psi)	Observed Jack Press. (kips)	Dial Gauge G1 (in)	Dial Gauge G2 (in)	Dial Gauge Corrected (in)	Total Movement (in)	Perm. Movement (in)	Elastic Movement (in)	Elastic Movement (theory)
5%	2.5	3.3	11:55	266	272	1.7	0.0000	0.0000	0.0000	0.0000			0.0030
15%	2.5	9.8	11:59	786	790	8.2	0.0370	0.0360	0.0365	0.0365			0.0091
30%	2.5	19.5	12:02	1566	1572	18.0	0.0990	0.0800	0.0895	0.0895			0.0182
45%	2.5	29.3	12:05	2346	2352	27.7	0.1560	0.1320	0.1440	0.1440			0.0272
60%	2.5	39.0	12:08	3126	3130	37.4	0.2140	0.1810	0.1975	0.1975			0.0363
75%	2.5	48.8	12:11	3906	3911	47.2	0.2750	0.2270	0.2510	0.2510			0.0454
90%	2.5	58.5	12:14	4686	4687	56.9	0.3330	0.2700	0.3015	0.3015			0.0545
100%	2.5	65.0	12:17	5206	5212	63.4	0.3800	0.2960	0.3380	0.3380			0.0605
115%	2.5	74.8	12:20	5986	5990	73.2	0.4180	0.3220	0.3700	0.3700			0.0696
130%	0	84.5	12:21	6766	6769	82.9	0.4170	0.3300	0.3735	0.3735			
130%	1	84.5	12:22	6766	6770	82.9	0.4260	0.3300	0.3780	0.3780			0.0787
130%	2	84.5	12:23	6766	6768	82.9	0.4270	0.3290	0.3780	0.3780			0.0787
130%	3	84.5	12:24	6766	6773	82.9	0.4270	0.3270	0.3770	0.3770			0.0787
130%	4	84.5	12:25	6766	6773	82.9	0.4250	0.3230	0.3740	0.3740			0.0787
130%	5	84.5	12:26	6766	6774	82.9	0.4240	0.3220	0.3730	0.3730			0.0787
130%	6	84.5	12:27	6766	6776	83.0	0.4220	0.3220	0.3720	0.3720			
130%	10	84.5	12:31	6766	6774	82.9	0.4260	0.3230	0.3745	0.3745			
145%	2.5	94.3	12:33	7546	7551	92.7	0.4430	0.3420	0.3925	0.3925			0.0878
160%	2.5	104.0	12:35	8326	8330	102.4	0.4700	0.3670	0.4185	0.4185	0.0690	0.3495	0.0968
130%	4	84.5	12:39	6766	6769	82.9	0.4580	0.3540	0.4060	0.4060			0.0787
100%	4	65.0	12:43	5206	5212	63.4	0.4430	0.3370	0.3900	0.3900			0.0605
75%	4	48.8	12:47	3906	3910	47.2	0.3640	0.2600	0.3120	0.3120			0.0454
50%	4	32.5	12:52	2606	2612	31.0	0.2950	0.1950	0.2450	0.2450			0.0303
25%	4	16.3	12:56	1306	1310	14.7	0.2000	0.1050	0.1525	0.1525			0.0151
5%	4	3.3	1:01	266	272	1.7	0.1120	0.0260	0.0690	0.0690			0.0030

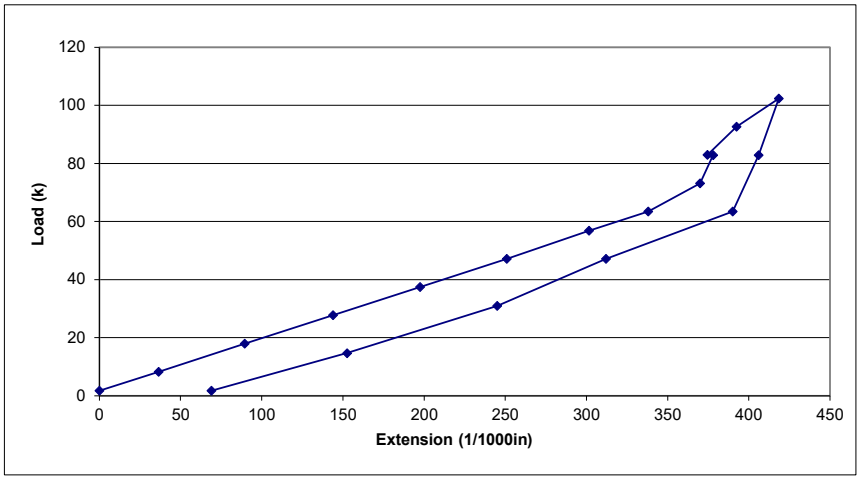
Anchor: Steamboat Basecamp Townhomes - 65 Kip Micropile Proof Test

Target % Des. Load (%)	Target % Des. Load (KIPS)	Calculated Load (kips)	Total Movement (0.001 in)	Perm. Movement (0.001 in)	Elastic Movement (0.001 in)	Theoretical Elast. Move. (0.001 in)	Free + 50% Bond Length (0.001 in)	80% Free Length (0.001 in)
5%	3	2	0.0	0.0	0.0	0	0	0
25%	10	8	36.5	0.0	0.0	6	34	5
50%	20	18	89.5	0.0	0.0	15	85	12
75%	29	28	144.0	0.0	0.0	24	136	19
100%	39	37	197.5	0.0	0.0	33	187	27
120%	49	47	251.0	0.0	0.0	42	239	34
167%	94	93	392.5	0.0	0.0	85	477	68

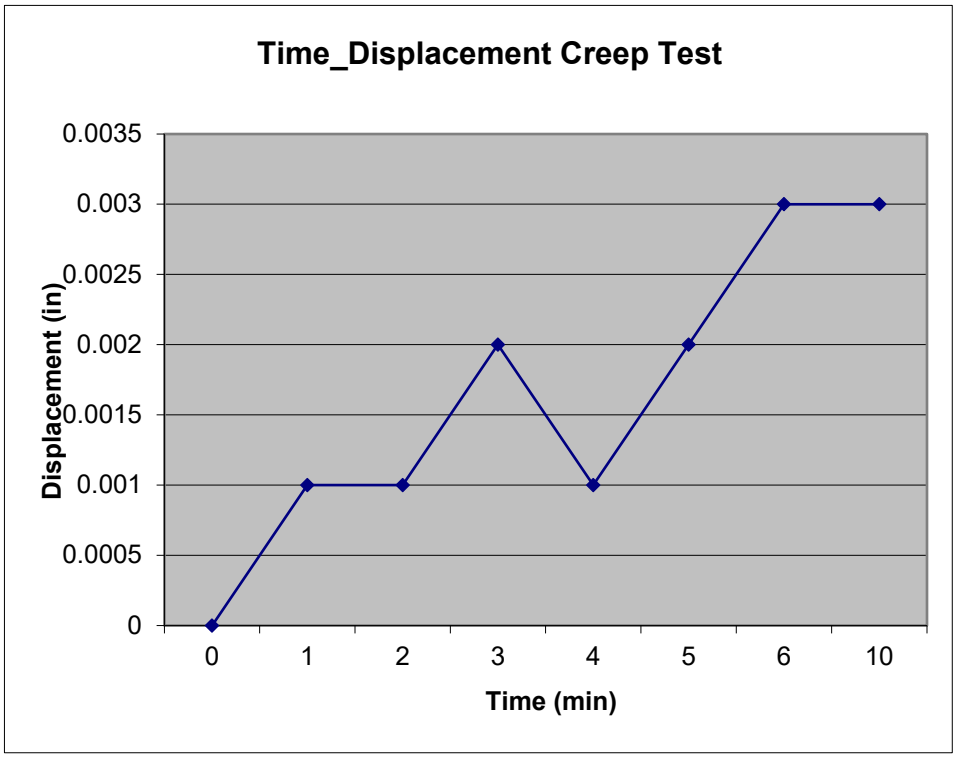


Anchor: Steamboat Basecamp Townhomes - 65 Kip Micropile Proof Test

Target % Des. Load (%)	Spec. Load (kisp)	Observed Load Jack (psi)	Observed Load Jack (kips)	Total Movement (in)	Total Movement (1/1000in)
5.0%	3	272.00	1.72	0.000	0
15.0%	10	790.00	8.19	0.037	37
30.0%	20	1572.00	17.96	0.090	90
45.0%	29	2352.00	27.71	0.144	144
60.0%	39	3130.00	37.42	0.198	198
75.0%	49	3911.00	47.18	0.251	251
90.0%	59	4687.00	56.87	0.302	302
100.0%	65	5212.00	63.43	0.338	338
115.0%	75	5990.00	73.15	0.370	370
130.0%	85	6770.00	82.89	0.378	378
130%	85	6774.00	82.94	0.375	375
145%	94	7551.00	92.65	0.393	393
160%	104	8330.00	102.38	0.419	419
130%	85	6769.00	82.88	0.406	406
100%	65	5212.00	63.43	0.390	390
75%	49	3910.00	47.17	0.312	312
50%	33	2612.00	30.95	0.245	245
25%	16	1310.00	14.69	0.153	153
5%	3	272.00	1.72	0.069	69



Test Load	Time	Dial Gauge	Creep
(kips)	(min)	(in)	(in)
73.77568	0	0.368	0
73.78817	1	0.369	0.001
73.80066	2	0.369	0.001
73.81316	3	0.37	0.002
73.80066	4	0.369	0.001
73.80066	5	0.37	0.002
73.77568	6	0.371	0.003
73.80066	10	0.371	0.003



Steamboat Basecamp Townhomes - 37 Kip Micropile Proof Test						Tested By Trever (MCSI) Observed by Enrique (NWCC)												
Micropile:			#58				**Test Date:**			10/02/23		**No. of Piles:**			1	
Starting Free Length:			11.00	ft	33	in	**Design Load:**			37	kip	**Modulus of Elasticity:**			29000	kip/in2
Starting Bond Length:			10.50	ft	126	in						**Bar Diameter:**		T30/11	1.180	in
Below Ground Free Length:			8	ft	96	in	**Max Test Load (160% DL):**			59	kip	**Bar Area:**			0.66	in2
Above Ground Free Length:			3.00	ft	36	in						**G.U.T.S per Bar:**				kip
Total Length:			21.50	ft	258	in										
Theoretical Elongation (calculate at max test load):					0.102	inches						**Jack-Gauge Factor:**			0.01245561	kip/psi
												Load Cell Serial Number:			-	
							Ram ID					**Load Cell Zero reading (avg.):**			-	
							Pump ID					**Load Cell Scale Factor:**			-	
							Gauge ID					**Load Cell Offset:**			-	
							Ref. Gauge									

% Design Load (%)	Holding Time (min)	Spec. Load (kips)	Calc. Jack Press. (psi)	Time of Reading (24h)	Observed Jack Press. (psi)	Dial Gauge G1 (in)	Dial Gauge G2 (in)	Correct. Avg. (in)	Elastic Movement (theoretical)	Comments
5%	2.5	1.9	154	2:13	200	0.0000	0.0000	0.0000	0.003	alignment load
15%	2.5	5.6	450	2:17	452	0.0300	0.0210	0.0255	0.010	
30%	2.5	11.1	894	2:19	900	0.0730	0.0720	0.0725	0.019	
45%	2.5	16.7	1338	2:22	1341	0.1160	0.1230	0.1195	0.029	
60%	2.5	22.2	1782	2:25	1787	0.1590	0.1720	0.1655	0.038	
75%	2.5	27.8	2226	2:28	2231	0.2000	0.2120	0.2060	0.048	
90%	2.5	33.3	2670	2:30	2672	0.2530	0.2660	0.2595	0.057	
100%	2.5	37.0	2966	2:33	2970	0.2850	0.2990	0.2920	0.064	
115%	2.5	42.6	3410	2:36	3412	0.3290	0.3420	0.3355	0.073	
130%	0	48.1	3854	2:39	3861	0.3990	0.3850	0.3920	0.083	
130%	1	48.1	3854	2:40	3860	0.3990	0.3840	0.3915	0.083	
130%	2	48.1	3854	2:41	3861	0.3980	0.3850	0.3915	0.083	
130%	3	48.1	3854	2:42	3862	0.3980	0.3840	0.3910	0.083	
130%	4	48.1	3854	2:43	3860	0.3990	0.3820	0.3905	0.083	
130%	5	48.1	3854	2:44	3859	0.3980	0.3820	0.3900	0.083	
130%	6	48.1	3854	2:45	3858	0.3990	0.3810	0.3900	0.083	
130%	10	48.1	3854	2:49	3861	0.3980	0.3810	0.3895	0.083	-0.003 Creep
145%	2.5	53.7	4298	2:52	4299	0.4400	0.4190	0.4295	0.092	
160%	2.5	59.2	4742	2:54	4750	0.5090	0.4620	0.4855	0.102	
130%	4	48.1	3854	2:58	3853	0.4920	0.4120	0.4520	0.083	
100%	4	37.0	2966	3:02	2970	0.4280	0.3450	0.3865	0.064	
75%	4	27.8	2226	3:06	2232	0.3580	0.2750	0.3165	0.048	
50%	4	18.5	1486	3:10	1490	0.2820	0.2030	0.2425	0.032	
25%	4	9.3	746	3:14	750	0.2130	0.1310	0.1720	0.016	
5%	4	1.9	154	3:18	200	0.1430	0.0670	0.1050	0.003	0.381 Elastic Movement

Steamboat Basecamp Townhomes - 37 Kip Micropile Proof Test

Anchor:	#58			
Starting Free Length:	11.00	ft	33	in
Starting Bond Length:	10.50	ft	126	in
Below Ground Free Length:	8.00	ft	96	in
Above Ground Free Length:	3.00	ft	36	in
Total Length:	21.50	ft	258	in
Theoretical Elongation (calculate at max test load):			0.102	inches
Apparent Free Length:	**128.5**	inches	**10.71**	ft
Debonding:	**-3.5**	inches	**-0.29**	ft
Apparent Bond Length:	**129.5**	inches	**10.79**	ft

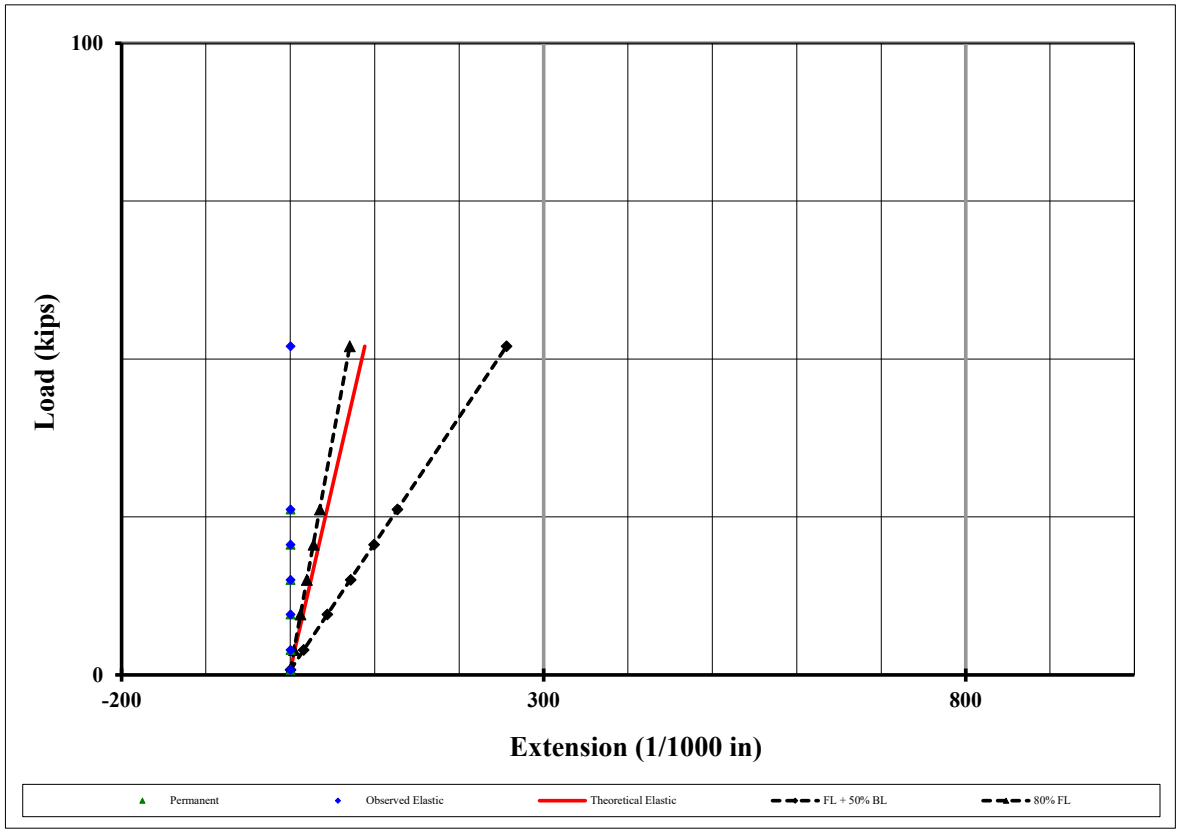
Test Date:	10/02/23	
Design Load:	37	kip
Est. Lock-off Load:	0	kip
Max Test Load (160%):	59	kip

No. of Strands:	1	
Modulus of Elasticity:	29000	kip/in2
Strand Area:	0.662	in2
G.U.T.S per strand:	0	kip
G.U.T.S. per anchor:	0	kip
Jack-Gauge Factor:	0.012455606	kip/psi
Load Cell Serial Number:	-	
Load Cell Zero reading (avg.):	-	
Load Cell Scale Factor:	-	
Load Cell Offset:	-	

% Design Load (%)	Holding Time (min)	Spec. Load (kips)	Time of Reading (24h)	Calc. Jack Press. (psi)	Observed Jack Press. (psi)	Observed Jack Press. (kips)	Dial Gauge G1 (in)	Dial Gauge G2 (in)	Dial Gauge Corrected (in)	Total Movement (in)	Perm. Movement (in)	Elastic Movement (in)	Elastic Movement (theory)
5%	2.5	1.9	2:13	154	200	0.8	0.0000	0.0000	0.0000	0.0000			0.0032
15%	2.5	5.6	2:17	450	452	4.0	0.0300	0.0210	0.0255	0.0255			0.0095
30%	2.5	11.1	2:19	894	900	9.6	0.0730	0.0720	0.0725	0.0725			0.0191
45%	2.5	16.7	2:22	1338	1341	15.1	0.1160	0.1230	0.1195	0.1195			0.0286
60%	2.5	22.2	2:25	1782	1787	20.6	0.1590	0.1720	0.1655	0.1655			0.0382
75%	2.5	27.8	2:28	2226	2231	26.2	0.2000	0.2120	0.2060	0.2060			0.0477
90%	2.5	33.3	2:30	2670	2672	31.7	0.2530	0.2660	0.2595	0.2595			0.0572
100%	2.5	37.0	2:33	2966	2970	35.4	0.2850	0.2990	0.2920	0.2920			0.0636
115%	2.5	42.6	2:36	3410	3412	40.9	0.3290	0.3420	0.3355	0.3355			0.0731
130%	0	48.1	2:39	3854	3861	46.6	0.3990	0.3850	0.3920	0.3920			
130%	1	48.1	2:40	3854	3860	46.5	0.3990	0.3840	0.3915	0.3915			0.0827
130%	2	48.1	2:41	3854	3861	46.6	0.3980	0.3850	0.3915	0.3915			0.0827
130%	3	48.1	2:42	3854	3862	46.6	0.3980	0.3840	0.3910	0.3910			0.0827
130%	4	48.1	2:43	3854	3860	46.5	0.3990	0.3820	0.3905	0.3905			0.0827
130%	5	48.1	2:44	3854	3859	46.5	0.3980	0.3820	0.3900	0.3900			0.0827
130%	6	48.1	2:45	3854	3858	46.5	0.3990	0.3810	0.3900	0.3900			
130%	10	48.1	2:49	3854	3861	46.6	0.3980	0.3810	0.3895	0.3895			
145%	2.5	53.7	2:52	4298	4299	52.0	0.4400	0.4190	0.4295	0.4295			0.0922
160%	2.5	59.2	2:54	4742	4750	57.7	0.5090	0.4620	0.4855	0.4855	0.1050	0.3805	0.1018
130%	4	48.1	2:58	3854	3853	46.5	0.4920	0.4120	0.4520	0.4520			0.0827
100%	4	37.0	3:02	2966	2970	35.4	0.4280	0.3450	0.3865	0.3865			0.0636
75%	4	27.8	3:06	2226	2232	26.2	0.3580	0.2750	0.3165	0.3165			0.0477
50%	4	18.5	3:10	1486	1490	16.9	0.2820	0.2030	0.2425	0.2425			0.0318
25%	4	9.3	3:14	746	750	7.7	0.2130	0.1310	0.1720	0.1720			0.0159
5%	4	1.9	3:18	154	200	0.8	0.1430	0.0670	0.1050	0.1050			0.0032

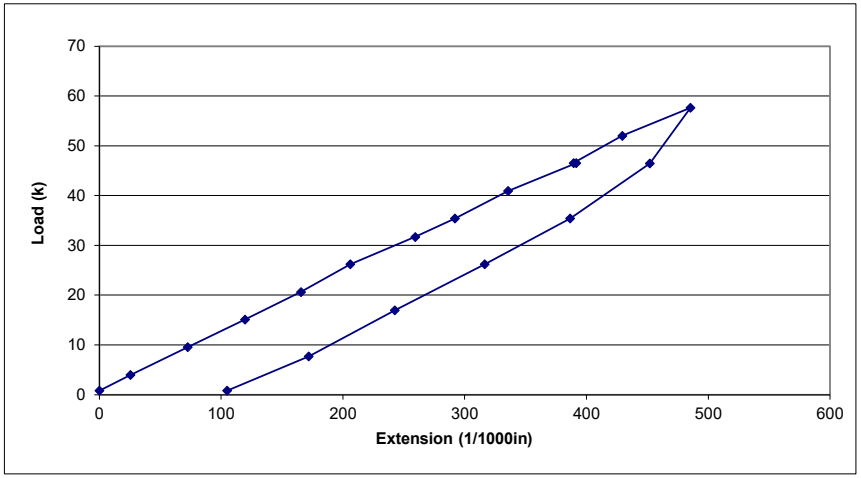
Anchor: Steamboat Basecamp Townhomes - 37 Kip Micropile Proof Test

Target % Des. Load (%)	Target % Des. Load (KIPS)	Calculated Load (kips)	Total Movement (0.001 in)	Perm. Movement (0.001 in)	Elastic Movement (0.001 in)	Theoretical Elast. Move. (0.001 in)	Free + 50% Bond Length (0.001 in)	80% Free Length (0.001 in)
5%	2	1	0.0	0.0	0.0	0	0	0
25%	6	4	25.5	0.0	0.0	5	16	4
50%	11	10	72.5	0.0	0.0	15	44	12
75%	17	15	119.5	0.0	0.0	25	71	20
100%	22	21	165.5	0.0	0.0	34	99	27
120%	28	26	206.0	0.0	0.0	44	127	35
167%	54	52	429.5	0.0	0.0	88	256	70

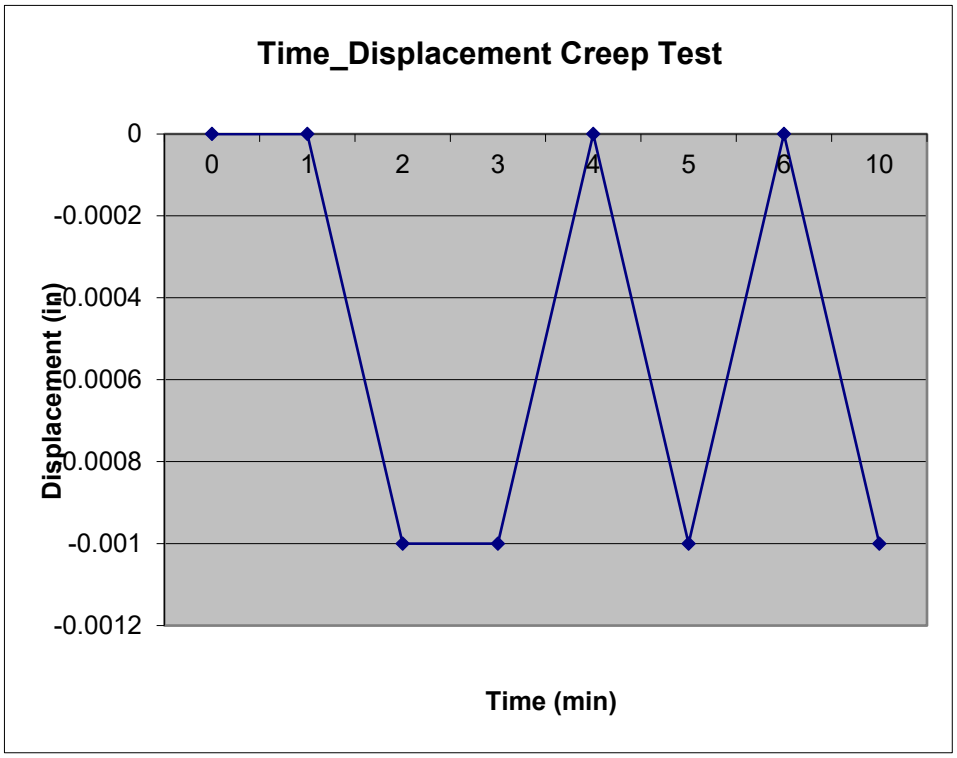


Anchor: Steamboat Basecamp Townhomes - 37 Kip Micropile Proof Test

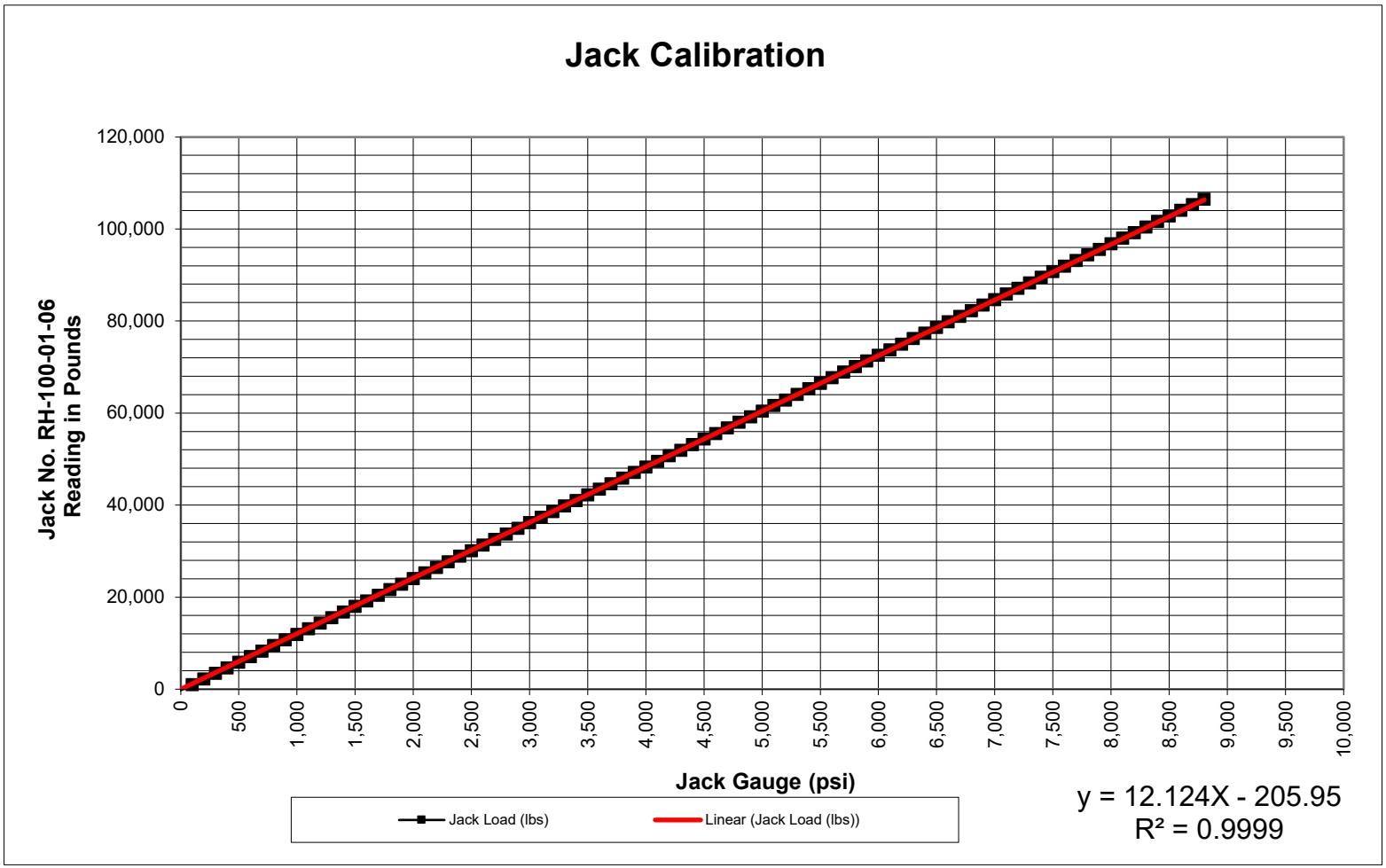
Target % Des. Load (%)	Spec. Load (kisp)	Observed Load Jack (psi)	Observed Load Jack (kips)	Total Movement (in)	Total Movement (1/1000in)
5.0%	2	200.00	0.82	0.000	0
15.0%	6	452.00	3.97	0.026	26
30.0%	11	900.00	9.57	0.073	73
45.0%	17	1341.00	15.08	0.120	120
60.0%	22	1787.00	20.65	0.166	166
75.0%	28	2231.00	26.19	0.206	206
90.0%	33	2672.00	31.70	0.260	260
100.0%	37	2970.00	35.43	0.292	292
115.0%	43	3412.00	40.95	0.336	336
130.0%	48	3860.00	46.54	0.392	392
130%	48	3861.00	46.56	0.390	390
145%	54	4299.00	52.03	0.430	430
160%	59	4750.00	57.66	0.486	486
130%	48	3853.00	46.46	0.452	452
100%	37	2970.00	35.43	0.387	387
75%	28	2232.00	26.21	0.317	317
50%	19	1490.00	16.94	0.243	243
25%	9	750.00	7.69	0.172	172
5%	2	200.00	0.82	0.105	105



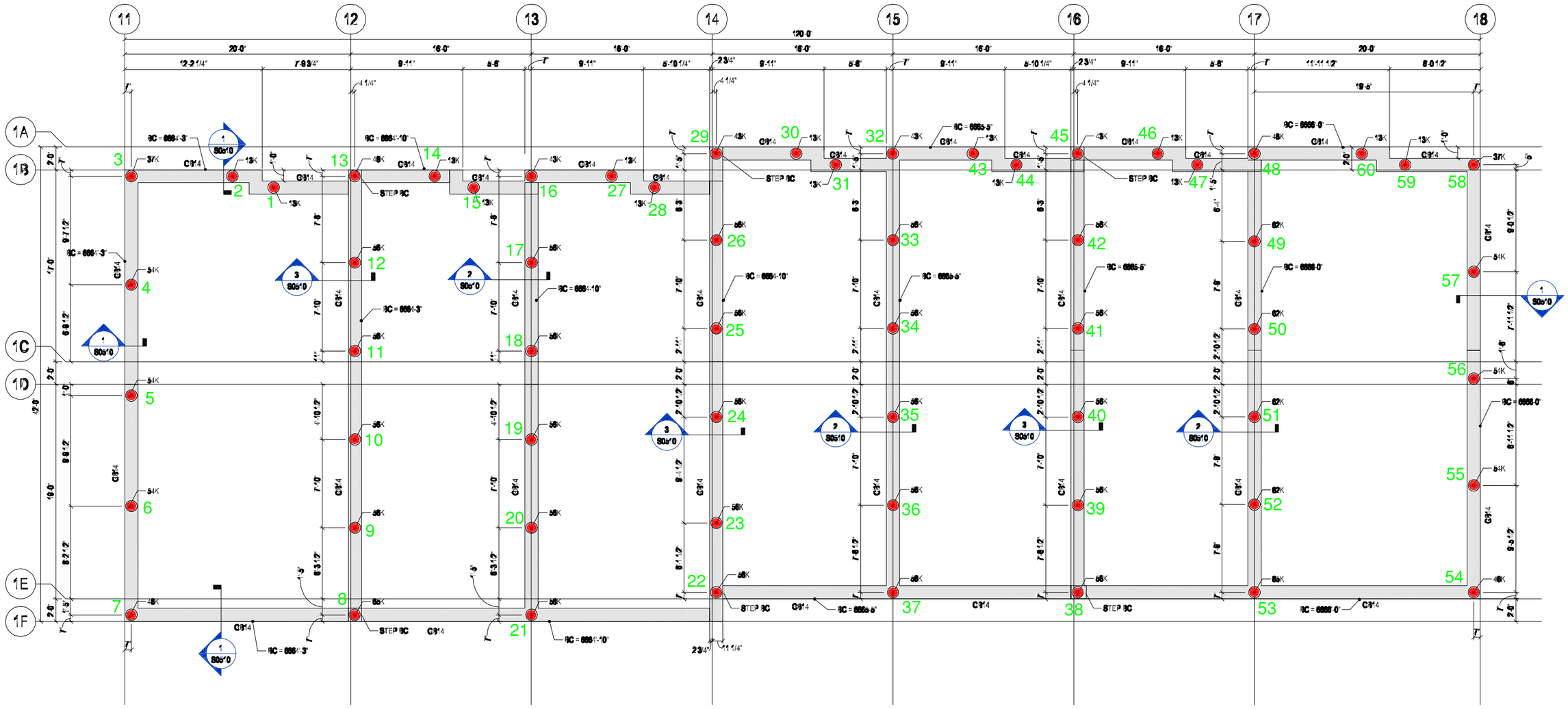
Test Load	Time	Dial Gauge	Creep
(kips)	(min)	(in)	(in)
46.55561	0	0.399	0
46.54312	1	0.399	0
46.55561	2	0.398	-0.001
46.5681	3	0.398	-0.001
46.54312	4	0.399	0
46.53063	5	0.398	-0.001
46.51814	6	0.399	0
46.55561	10	0.398	-0.001



Anchor: Steamboat Basecamp Townhomes - 37 Kip Micropile Proof Test



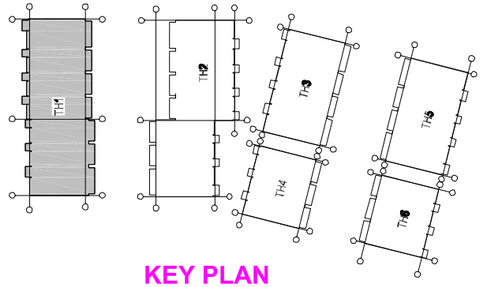
NWCC TESTING REPORTS



FOUNDATION PLAN

North

(SEE SHEET SW4 FOR MICROPILE DETAILS)



KEY PLAN

FOUNDATION PLAN INFORMATION TAKEN FROM
"anthem structural emgineers" SHEET S0210–TH1
FOR INFORMATION ONLY FIELD VERIFY LOCATIONS
PES NOT RESPONSIBLE FOR MICROPILE LAYOUT OR
GRID LINE ACCURACY

COLORADO LICENSED
THOMAS A. PRINTZ
41258
PROFESSIONAL ENGINEER
8-15-2023

PRINTZ ENGINEERING SERVICES
~Designs in Integrity~
1248 W. El Toro Way
Pueblo West, CO 81007
phone and fax:
719-547-8789
23098

DESIGN, BY:	TOM PRINTZ P.E
SCALE:	N/A
DATE:	8-15-2023
DRAWN BY:	CJT
SHEET TITLE	SW3

CUSTOMER: Mays Construction Specialties
PROJECT: Basecamp Townhomes
LOCATION: Steamboat Springs, CO

NORTHWEST COLORADO CONSULTANTS
MICROPILE OBSERVATION DATA SHEET

Project: Basecamp Townhomes **Project No.:** 20-11961 **Date:** 9/26/23
Phase 2 **Report No.:** 1-MP

Micropile No.	MP Dia. (in.)	Depth in Overburden (ft.)	Total Length Drilled (ft.)	Plumb	Supporting Stratum
56	5		28 ½	Yes	Sands & Gravels
57	5		28 ½	Yes	Sands & Gravels
58	5		19	Yes	Sands & Gravels
59	5		18 ½	Yes	Sands & Gravels
60	5		18 ½	Yes	Sands & Gravels
48	5		23 ½	Yes	Sands & Gravels
49	5		33 ½	Yes	Sands & Gravels
50	5		33 ½	Yes	Sands & Gravels
47	5		18 ½	Yes	Sands & Gravels
46	5		18 ½	Yes	Sands & Gravels
41	5		28 ½	Yes	Sands & Gravels
42	5		28 ½	Yes	Sands & Gravels
45	5		23 ½	Yes	Sands & Gravels
44	5		18 ½	Yes	Sands & Gravels
43	5		18 ½	Yes	Sands & Gravels
34	5		28 ½	Yes	Sands & Gravels
33	5		28 ½	Yes	Sands & Gravels
32	5		23 ½	Yes	Sands & Gravels
31	5		18 ½	Yes	Sands & Gravels
30	5		18 ½	Yes	Sands & Gravels

NORTHWEST COLORADO CONSULTANTS, INC.
FIELD REPORT

Project:	Basecamp Townhomes Phase 2	**Project No.:**	20-11961	**Date:**	9/26/23
				Time:	10.5
Location:	Steamboat Springs, CO	**Report No.:**	1-MP	**Mileage:**	2
Client:	Steamboat Basecamp LLC			**Engr. /Tech:**	EL

Work Performed:

As requested, we visited the project site on today's date to observe the micropile drilling operations. The micropile drilling contractor, Mays Construction Specialties, completed twenty (20) 5-inch diameter piles. Summary logs of the micropiles completed on this date are attached.

We also observed the placement of the reinforcing steel and grout in the micropiles completed on this date.

While on-site we cast one set of three 2x2 grout cubes, Sample No. 1G, for compressive strength determination of the grout placed in the micropiles. The compressive strength test results will be forwarded upon completion.

Remarks:

Based on our observations, the micropiles completed on this date appeared to be constructed in general accordance with the structural plans prepared by Printz Engineering Services.

Verbal Discussions:

Trevor of Mays Construction Specialties Inc., was aware of today's site visit and observations.

NORTHWEST COLORADO CONSULTANTS
MICROPILE OBSERVATION DATA SHEET

Project: Basecamp Townhomes Phase 2 **Project No.:** 20-11961 **Report No.:** 2-MP **Date:** 9/27/23

Micropile No.	MP Dia. (in.)	Depth in Overburden (ft.)	Depth in Bedrock (ft.)	Total Length Drilled (ft.)	Plumb	Supporting Stratum
25	5			28 ½	Yes	Sands & Gravels
26	5			28 ½	Yes	Sands & Gravels
29	5			23 ½	Yes	Sands & Gravels
18	5			28 ½	Yes	Sands & Gravels
17	5			28 ½	Yes	Sands & Gravels
16	5			23 ½	Yes	Sands & Gravels
28	5			18 ½	Yes	Sands & Gravels
27	5			18 ½	Yes	Sands & Gravels
15	5			18 ½	Yes	Sands & Gravels

NORTHWEST COLORADO CONSULTANTS, INC.
FIELD REPORT

Project:	Basecamp Townhomes Phase 2	**Project No.:**	20-11961	**Date:**	9/27/23
				Time:	8.0
Location:	Steamboat Springs, CO	**Report No.:**	2-MP	**Mileage:**	4
Client:	Steamboat Basecamp LLC			**Engr. /Tech:**	EL

Work Performed:

As requested, we visited the project site on today's date to observe the micropile drilling operations. The micropile drilling contractor, Mays Construction Specialties, completed nine (9) 5-inch diameter piles. Summary logs of the micropiles completed on this date are attached.

We also observed the placement of the reinforcing steel and grout in the micropiles completed on this date.

While on-site we cast one set of three (3) 2x2 grout cubes, Sample No. 2G, for compressive strength determination of the grout placed in the micropiles. The compressive strength test results will be forwarded upon completion.

In addition, we transported the grout cubes cast on 09/26/23 to our laboratory in Steamboat Springs, Colorado for curing and compressive strength determination. The compressive strength test results will be forwarded upon completion.

Remarks:

Based on our observations, the micropiles completed on this date appeared to be constructed in general accordance with the structural plans prepared by Printz Engineering Services.

It should be noted that Mays Construction Specialties had issues with their micropile machine and grout hose getting plugged throughout the day.

Verbal Discussions:

Trevor of Mays Construction Specialties Inc. was aware of today's site visit and test results.

NORTHWEST COLORADO CONSULTANTS
MICROPILE OBSERVATION DATA SHEET

Project: Basecamp Townhomes Phase 2 **Project No.:** 20-11961 **Report No.:** 3-MP **Date:** 9/28/23

Micropile No.	MP Dia. (in.)	Depth in Overburden (ft.)	Depth in Bedrock (ft.)	Total Length Drilled (ft.)	Plumb	Supporting Stratum
14	5			18 ½	Yes	Sands & Gravels
1	5			18 ½	Yes	Sands & Gravels
2	5			18 ½	Yes	Sands & Gravels
3	5			18 ½	Yes	Sands & Gravels
11	5			28 ½	Yes	Sands & Gravels
12	5			28 ½	Yes	Sands & Gravels
13	5			23 ½	Yes	Sands & Gravels
4	5			28 ½	Yes	Sands & Gravels
5	5			28 ½	Yes	Sands & Gravels
6	5			28 ½	Yes	Sands & Gravels
7	5			23 ½	Yes	Sands & Gravels
40	5			28 ½	Yes	Sands & Gravels
39	5			28 ½	Yes	Sands & Gravels
38	5			28 ½	Yes	Sands & Gravels
35	5			28 ½	Yes	Sands & Gravels
36	5			28 ½	Yes	Sands & Gravels
37	5			28 ½	Yes	Sands & Gravels
23	5			28 ½	Yes	Sands & Gravels
24	5			28 ½	Yes	Sands & Gravels
22	5			28 ½	Yes	Sands & Gravels
19	5			28 ½	Yes	Sands & Gravels
20	5			28 ½	Yes	Sands & Gravels

NORTHWEST COLORADO CONSULTANTS, INC.
FIELD REPORT

Project:	Basecamp Townhomes Phase 2	**Project No.:**	20-11961	**Date:**	9/28/23
				Time:	10.5
Location:	Steamboat Springs, CO	**Report No.:**	3-MP	**Mileage:**	2
Client:	Steamboat Basecamp LLC			**Engr. /Tech:**	EL

Work Performed:

As requested, we visited the project site on today's date to observe the micropile drilling operations. The micropile drilling contractor, Mays Construction Specialties, completed twenty-two (22) 5-inch diameter piles. Summary logs of the micropiles completed on this date are attached.

We also observed the placement of the reinforcing steel and grout in the micropiles completed on this date.

While on-site we cast one set of three (3) 2x2 grout cubes, Sample No. 3G, for compressive strength determination of the grout placed in the micropiles. The compressive strength test results will be forwarded upon completion.

In addition, we transported the grout cubes cast on 09/27/23 to our laboratory in Steamboat Springs, Colorado for curing and compressive strength determination. The compressive strength test results will be forwarded upon completion.

Remarks:

Based on our observations, the micropiles completed on this date appeared to be constructed in general accordance with the structural plans prepared by Printz Engineering Services.

Verbal Discussions:

Trevor of Mays Construction Specialties Inc. was aware of today's site visit and test results.

NORTHWEST COLORADO CONSULTANTS
MICROPILE OBSERVATION DATA SHEET

Project: Basecamp Townhomes Phase 2 **Project No.:** 20-11961 **Report No.:** 4-MP **Date:** 9/29/23

Micropile No.	MP Dia. (in.)	Depth in Overburden (ft.)	Depth in Bedrock (ft.)	Total Length Drilled (ft.)	Plumb	Supporting Stratum
21	5			28 ½	Yes	Sands & Gravels
10	5			28 ½	Yes	Sands & Gravels
9	5			28 ½	Yes	Sands & Gravels
8	5			33 ½	Yes	Sands & Gravels
51	5			33 ½	Yes	Sands & Gravels
52	5			33 ½	Yes	Sands & Gravels
53	5			33 ½	Yes	Sands & Gravels
55	5			28 ½	Yes	Sands & Gravels
54	5			23 ½	Yes	Sands & Gravels

NORTHWEST COLORADO CONSULTANTS, INC.
FIELD REPORT

Project:	Basecamp Townhomes Phase 2	**Project No.:**	20-11961	**Date:**	9/29/23
				Time:	5.0
Location:	Steamboat Springs, CO	**Report No.:**	4-MP	**Mileage:**	2
Client:	Steamboat Basecamp LLC			**Engr. /Tech:**	EL

Work Performed:

As requested, we visited the project site on today's date to observe the micropile drilling operations. The micropile drilling contractor, Mays Construction Specialties, completed nine (9) 5-inch diameter piles. Summary logs of the micropiles completed on this date are attached.

We also observed the placement of the reinforcing steel and grout in the micropiles completed on this date.

While on-site we cast one set of three (3) 2x2 grout cubes, Sample No. 4G, for compressive strength determination of the grout placed in the micropiles. The compressive strength test results will be forwarded upon completion.

In addition, we transported the grout cubes cast on 09/28/23 to our laboratory in Steamboat Springs, Colorado for curing and compressive strength determination. The compressive strength test results will be forwarded upon completion.

Remarks:

Based on our observations, the micropiles completed on this date appeared to be constructed in general accordance with the structural plans prepared by Printz Engineering Services.

Verbal Discussions:

Trevor of Mays Construction Specialties Inc. was aware of today's site visit and test results.

NORTHWEST COLORADO CONSULTANTS, INC.
FIELD REPORT

Project:	Basecamp Townhomes Phase 2	**Project No.:**	20-11961	**Date:**	10/2/23
				Time:	8.0
Location:	Steamboat Springs, CO	**Report No.:**	5-MP	**Mileage:**	2
Client:	Steamboat Basecamp LLC			**Engr. /Tech:**	EL

Work Performed:

As requested, we visited the project site on today's date to observe the micropile pull out tests being completed for three different micropiles. Micropile No.'s 35, 50 & 58 were tested in accordance with Printz Engineering Services. All three pull out tests were tested at 160% of the required design load.

Micropile No. 35 moved a maximum of 0.347 hundredths of an inch. Micropile No. 50 moved a maximum of 0.470 hundredths of an inch. Micropile No. 58 moved a maximum of 0.509 hundredths of an inch. All the tests passed the micropile design load.

In addition, we transported the grout cubes cast on 09/29/23 to our laboratory in Steamboat Springs, Colorado for curing and compressive strength determination. The compressive strength test results will be forwarded upon completion.

Verbal Discussions:

Trevor of Mays Construction Specialties Inc. was aware of today's site visit and test results.